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XI.

UNDULATIONS OBSERVED IN THE TAIL OF COGGIA'S
COMET, 1874.

BY L. TROUVELOT.

Presented Nov. 14, 1877.

ON the evening of July 21, 1874, at 9^h 0^m, the moon being in her first quarter, and the sky remarkably clear even close to the horizon, my attention was attracted by a bright ray of light darting from the north-western horizon, way up in the constellations. Taking it for an auroral phenomenon, I went in for the spectroscope; but on my return, after a few seconds, to my disappointment I found no more trace of it. Soon, however, it reappeared, and darted up in an instant after the manner of certain auroral rays, and vanished again after ten or fifteen seconds. I then became aware of my error, and found with surprise that the phenomenon was taking place in the tail of Coggia's comet, the head of which was then plunged under the horizon.

During the whole time that I observed this interesting phenomenon, I saw the comet's tail shortening and extending, lightening up and extinguishing like the rays of certain auroras. Extended undulations, rapid vibrations, ran along it in succession from the horizon to its extremity, giving it the appearance of a fine gauze wavering in a strong breeze. The pulsations and the waves of light were of unequal duration; some being rapid, while others lasted a longer time. For over one hour, the comet's tail kindled and extinguished more than one hundred times; the extinction being sometimes so complete that it was impossible to see any trace of the comet; while sometimes it became so bright that, in spite of the light of the moon, it could be distinguished easily in all its contours, even to its very extremity, which was then a little to the south of γ Ursa Majoris.

Be it coincidence or not, at the moment that this phenomenon was occurring, a strong magnetic perturbation was going on in Cambridge, where the declination needle oscillated through an angle of 1° 27',

although no auroral light was seen ; and by the kindness of Mr. Cleveland Abbe, of the Signal Corps, I learn that no aurora was reported for that night.

It is not a new thing to see vibrations and pulsations running along the tails of comets. Many observers have seen this phenomenon ; among others, Longomontanus, Vandelin, Snellius, and Father Cysat, who are reported to have seen undulations taking place in the border of the comet of 1618, as if it was agitated by the wind. Hevelius observed analogous motions in the comets of 1652 and 1661. Pingré asserted that he distinctly saw, in the long tail of the comet of 1769, "*des ondulations semblables à celles que les aurores boréales présentent.*" * According to Winnecke, from the 5th to the 12th of October, 1858, the rays forming the superior part of Donati's comet spread and contracted suddenly, like the rays of the aurora.

CAMBRIDGE, Jan. 5, 1877.

* Arago, *Astro. Popu.*, vol. ii. p. 439, Paris, 1855.